

CIVL1100: Fundamentals of Engineering Mechanics

Singapore PSB

Trimester 3 - 2023 (Singapore)



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description	This course introduces some basic principles of engineering mechanics in as simple a manner as possible. Emphasis is placed upon students gaining a real understanding of the laws and principles of mechanics. This course provides essential foundation knowledge for all disciplines of engineering and surveying and will be assumed knowledge in many of the courses taken in later years of undergraduate programs.
Academic Progress Requirements	Nil
Requisites	Students who have successfully completed FNEG1004 cannot enrol in this course.
Assumed Knowledge	Knowledge of trigonometry and calculus as gained through completion of MATH1002 or higher or HSC Extension Maths
Contact Hours	Singapore PSB Lecture Face to Face On Campus 2 hour(s) per week(s) for Full Term starting Week 1 2 separate lectures per week. All lectures are unique; there are no repeat lectures. Lecture Face to Face On Campus 2 hour(s) per week(s) for Full Term starting Week 1 2 separate lectures per week. All lectures are unique; there are no repeat lectures. Tutorial Face to Face On Campus 2 hour(s) per week(s) for Full Term starting Week 2 1 x 2 hour tutorial per week.
Unit Weighting	10
Workload	Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator **Singapore PSB**
Prof Mark Masia
Mark.Masia@newcastle.edu.au
+61 2 4921 5295
Consultation: by email.

Teaching Staff Tan Juay Seng will be the lecturer and tutor for the course.

School Office **School of Engineering (Callaghan)**
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SYLLABUS

Course Content • Basic assumptions of theory of structures: ideal materials, small deflections
• Equilibrium, redundancy, stability
• Stress, strain, extension of bars
• Compatibility
• Bending Moment and Shear Force diagrams for simple beams
• Properties of areas
• Stresses due to bending: normal and shear
• Combined stresses
• Column buckling
• Hydrostatics

Course Learning Outcomes **On successful completion of this course, students will be able to:**
1. Apply the laws and principles of mechanics to a basic level

2. Formulate, analyse and solve simple problems in mechanics

3. Recognise the assumptions and limitations of the approaches used

Course Materials **Lecture Materials:**
- Power Point lecture slides will be made available on the Canvas course site.

Multi-Media Resource:
- Video recordings for lectures will be available via the Canvas course site.

Required Text:
- Course notes 'Elementary Structures and Hydrostatics' are available in electronic format for download from the Canvas site for this course. The course notes are the only required text.

ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Assignment 1	Friday 5pm in Week 4	Individual	10%	1, 2, 3
2	Assignment 2	Friday 5pm in Week 9	Individual	10%	1, 2, 3
3	Assignment 3	Friday 5pm in Week 12	Individual	10%	1, 2, 3
4	Mid-semester examination	Exam held during the second lecture in Week 6	Individual	20%	1, 2, 3
5	Final Formal Examination	Formal examination period	Individual	50%	1, 2, 3

Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Assignment 1

Assessment Type	Written Assignment
Purpose	Encourage student learning, and allow progressive assessment and feedback, in a staged approach throughout the semester
Description	Formulate and solve mechanics problems based on the problem descriptions provided
Weighting	10%
Due Date	Friday 5pm in Week 4
Submission Method	Online
	The assignment question will be posted on Canvas at least two weeks prior to the submission date. You are required to submit your assignment online via Canvas. The submission must include an assignment cover sheet. Please scan all pages into a single pdf document for upload to Canvas.
Assessment Criteria	Please write legibly and show all steps in the calculation! Use the worked examples in the course notes and on Canvas as a guide to set out your solutions. It is expected that you will submit work that is your own. This does not preclude you consulting your colleagues or tutors. However, plagiarism and copying are not acceptable. Neither are they helpful to your academic progress. Individual difficulties should be discussed with the tutors or the lecturer. Marks for questions will be weighted according to time taken/steps involved. Part marks will be awarded for correct working even if final answer is incorrect.
Return Method	Online
Feedback Provided	Online - Marks returned two weeks after due date. Worked solution provided on Canvas one week after assignment due date

Assessment 2 - Assignment 2

Assessment Type	Written Assignment
Purpose	Encourage student learning, and allow progressive assessment and feedback, in a staged approach throughout the semester
Description	Formulate and solve mechanics problems based on the problem descriptions provided
Weighting	10%
Due Date	Friday 5pm in Week 9
Submission Method	Online
	Please see details for Assignment 1
Assessment Criteria	Marks for questions will be weighted according to time taken/steps involved. Part marks will be awarded for correct working even if final answer is incorrect.
Return Method	Online
Feedback Provided	Online - Marks returned two weeks after due date. Worked solution provided on Canvas one week after assignment due date

Assessment 3 - Assignment 3

Assessment Type	Written Assignment
Purpose	Encourage student learning, and allow progressive assessment and feedback, in a staged approach throughout the semester
Description	Formulate and solve mechanics problems based on the problem descriptions provided
Weighting	10%
Due Date	Friday 5pm in Week 12
Submission Method	Online
Assessment Criteria	Please see details for Assignment 1
Return Method	Online
Feedback Provided	Online - Marks returned two weeks after due date. Worked solution provided on Canvas one week after assignment due date

Assessment 4 - Mid-semester examination

Assessment Type	In Term Test
Purpose	To assess and provide feedback on student learning of the course content up to Week 4
Description	One hour multiple choice closed book exam held during the second lecture in Week 6. The content of the exam will be the course content covered during the first 4 weeks of lectures.
Weighting	20%
Due Date	Exam held during the second lecture in Week 6
Submission Method	In Class
Assessment Criteria	Exam paper to be submitted at completion of exam
Return Method	Multi-stage problems will be divided into several separate multiple choice questions to allow for part marks to be gained for partially correct answers.
Feedback Provided	Online
	Online - Two weeks after examination. Feedback is via mark achieved

Assessment 5 - Final Formal Examination

Assessment Type	Formal Examination
Description	120 minute written examination held during the formal exam period. The exam will cover all course content from Week 1 to Week 12. For practice, attempt final examination questions from previous years. A number of past exams with worked solutions will be posted on Canvas. The examination will be closed book but a summary of all major formulae will be provided with the examination paper.
Weighting	50%
Due Date	Formal examination period
Submission Method	Formal Exam
Assessment Criteria	Exam paper to be submitted at completion of exam
Return Method	Marks for questions will be weighted according to time taken/steps involved. Part marks will be awarded for correct working even if final answer is incorrect.
Feedback Provided	Not Returned
	Online - At same time as course marks released to students. Feedback is via mark achieved

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of

		skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures> that support a safe and respectful environment at the University.

Graduate Profile Statements

This course builds students' capacity in the following University of Newcastle Bachelor of Engineering Graduate Profile Statements (based on 2011 Engineers Australia revised Stage 1 Competency Standards for Professional Engineers):

UON Att.	University of Newcastle Bachelor of Engineering Graduate Profile Statements/ Engineers Australia Stage 1 competency statements	Taught	Practised	Assessed	Skill Level (1-4)
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability				
12	3.2. Effective oral and written communication in professional and lay domains.		☑	☑	1
13	3.3. Creative, innovative and pro-active demeanour.		☑	☑	1
14	3.4. Professional use and management of information.				
15	3.5. Orderly management of self, and professional conduct.				
16	3.6. Effective team membership and team leadership.		☑	☑	1
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	☑	☑	☑	1
8	2.2. Fluent application of engineering techniques, tools and resources.	☑	☑	☑	1
9	2.3. Application of systematic engineering synthesis and design processes.				
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.				
	Knowledge Base				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.	☑	☑	☑	1
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.				
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	☑	☑	☑	1
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.				
5	1.5. Knowledge of contextual factors impacting the engineering discipline.				
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.				

This course outline was approved by the Head of School on 23rd August 2023. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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